Beyond Subjective and Objective in Statistics

Comment on "Beyond Subjective and Objective in Statistics"

Jan Sprenger*

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I would like to congratulate Professors Gelman and Hennig with a paper that bridges philosophical and statistical inquiry in an impressive way. They deserve credit for taking subjective judgment out of the closet, and for showing how it improves statistical reasoning when applied in an transparent, open-minded, and empirically informed fashion. This connects well to philosophical analysis of the social dimension of objectivity: transparency about subjective assumptions facilitates scientific discussion, opens up avenues for mutual criticism, and promotes the formation of a balanced, informed judgment (Longino, 1990; Harding, 1991; Douglas, 2009; Sprenger, 2017b).

The paper is also notable for what it does *not* say: that objectivity corresponds to value freedom, and that the impact of data on theory can be assessed without reference to values. A long research tradition in philosophy of science has found this ideal unattainable, especially in the context of inductive reasoning (e.g., Rudner, 1953; Hempel, 1965; Douglas, 2000; Reiss and Sprenger, 2014). With regard to the role of values in inference, I invite the authors to expand on the virtue of impartiality (Table 1, V3). Does it involve priority of evidence over values, or balancing values against each other, as Douglas (2004, 2009) suggests?

The rest of this note is devoted to removing a common misunderstanding about Bayesian inference. Gelman and Hennig write that Bayesian inference should not be limited to the analysis of subjective beliefs (p. 26). I agree, but I would like to be more radical and deny that Bayesian inference should be understood like this in the first place. Probably no Bayesian statistician thinks that the prior distribution over different parameter values mirrors her *actual* degrees of belief (see also Gelman and Shalizi, 2013). Rather, the prior formalizes the degrees of belief she would have on the *supposition* that the overarching statistical model is true. Of course, all these models are highly idealized and most probably false. The prior and posterior distribution

*Contact information: Tilburg Center for Logic, Ethics and Philosophy of Science (TiLPS), Tilburg University, P.O. Box 90153, 5000 LE Tilburg, The Netherlands. Email: j.sprenger@uvt.nl. Webpage: www.laeuferpaar.de

should not be understood as determining betting odds on the truth of the various hypotheses; rather, they express *relative plausibility judgments* conditional on a given model (Sprenger, 2017a).

Like anywhere in science, these judgments are only as reliable as the model from which they are derived: garbage in, garbage out. The "Falsificationist Bayesianism" discussed in Section 5.5 flows naturally from taking the subjective Bayesian approach seriously. It makes explicit that inferences within a model need to be complemented by checking the adequacy of the model itself. And I agree with Gelman and Hennig that this critical perspective is vital for Bayesians in pursuit of scientific objectivity.

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